IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: PELLENC, Roger

SERIAL NO.:   (International Serial No. PCT/FR2004/000714)

FILED: Herewith (International Filing Date: 23 March 2004)

TITLE: METHOD AND DEVICE FOR ANALYSIS OF THE STRUCTURE AND THE
       COMPOSITION OF CULTURED HEDGES SUCH AS FOR EXAMPLE ROWS OF
       VINES

REMARKS ON PRELIMINARY AMENDMENT

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

In conjunction with the filing of the present application, and prior to an initial Official Action

on this matter, please amend the above-identified application as provided in the attached Marked Up

Copy and Substitute Specification.

Please note that the following amendments in the Substitute Specification apply to the

attached specification and claims labeled for "U.S. filing". This combined application incorporates

the original application and any amendments or annex to the International Application in the proper

order, including the correct original and substitute pages, claims and drawing sheets.

In this preliminary amendment, please consider the following remarks in conjunction with

the amendments to the above-identified application as follows:

REMARKS

The present Preliminary Amendment has been entered for the purpose of placing the

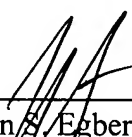application into a more proper U.S. format. In particular, certain grammatical and idiomatic

inconsistencies have been corrected by amendment to the specification, and the application is corrected for certain typographical errors found in the originally submitted application. No new matter has been added by these amendments. The present application incorporates the original filing including any amendments made in the international filing. There was no amendment in the International Application, and there was no annex to the International Preliminary Examination Report. There was a Demand for IPE filed, and the International Preliminary Examination Report addresses the originally filed claims only. The specification is an English translation of an originally French language document.

The Claims have been amended so as to conform with U.S. requirements and so as to remove multiple dependent claims. The Abstract has been amended so as to conform to U.S. filing requirements.

Applicant respectfully requests that the present Amendment be entered prior to an initial Official Action on the present application.

Respectfully submitted,

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Date

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<div align="center">CLAIMS</div>

I claim:

1. (Currently amended) Process ~~and a device~~ for analysis of the structure of cultivated hedgerows adapted to a machine that is mobile in continuous operation in trained and/or staked plantations, such as vineyards, ~~characterized in that the~~ said process <u>comprising the steps of:</u>

~~utilizes~~ <u>utilizing</u> an artificial vision system ~~(4)~~ functioning by direct transmission ~~making it possible~~ to determine blockages of light between one or more emitters ~~(E1, E2, E3...)~~ and one or more receivers ~~(R1, R2, R3...)~~ placed facing each other, on either side of the hedgerow, and

<u>handling</u> ~~in that the~~ information produced by these blockages of light ~~is handled~~ by an electronic analysis system ~~(7)~~ programmed or configured to examine the elements of the structure of the hedgerow, either during the day or at night.

2. (Currently amended) Process according to claim 1, ~~characterized in that the~~ <u>further comprising:</u>

<u>eliminating</u> influence of interfering solar light ~~is eliminated~~ by using a light periodically modulated by the emitters, the receivers only being sensitive to the modulated light and not to the continuous component of the light.

3. (Currently amended) Process according to ~~claims 1 or 2, characterized in that the~~ <u>Claim 1, further comprising:</u>

<u>reducing</u> significance of the interfering light ~~is reduced~~ by selecting emission and reception wavelengths for which the solar light is relatively weak, i.e. outside of the visible

spectrum, either a wavelength of light less than 400 nm or greater than 750 nm, and, for example, a wavelength on the order of 950 nm.

4. (Currently amended) Process according to ~~one of the claims 2 or 3, in which~~ Claim 2, wherein the artificial vision system ~~(4)~~ comprises, ~~on the one hand,~~ at least one front emitter ~~(E1)~~ and rear emitter ~~(E2)~~, and, ~~on the other hand,~~ at least one front receiver ~~(R11, R12, R13…)~~ and a rear receiver ~~(R21, R22, R23,…)~~, in considering the direction of the movement of the machine designed for this vision system, ~~characterized in that~~ wherein each front emitter ~~(E1)~~ and rear emitter ~~(E2)~~ emits, in an alternating manner, for example, over a duration on the order of 500 $p\mu$s, modulated light at a frequency corresponding to the frequency that matches the front receivers ~~(R11, R12, R13…)~~ and rear receivers ~~(R21, R22, R23…)~~, respectively.

5. (Currently amended) Process according to claim 4, ~~characterized in that~~ further comprising:

programming or configuring the electronic analysis system ~~is programmed or configured in order~~ to handle the information generated by the blockages of light, in order to measure the speed of movement of the machine and to adjust the rotational speed of the rotary tools of the machine as a function of the measured speed of movement.

6. (Currently amended) Process according to ~~any one of the claims 1 to 5, characterized in that~~ Claim 1, further comprising:

programming or configuring the electronic analysis system ~~is programmed or configured in order~~ to use the information generated by the blockages of light, in order to detect the stakes of the hedgerow.

7. (Currently amended) Process according to ~~claims 1 to 6, characterized in that~~ Claim 1, further comprising:

programming or configuring the electronic analysis system ~~is programmed or configured in order~~ to use the information generated by the blockages of light, in order to detect the position of the cordon.

8. (Currently amended) Process according to ~~claims 1 to 7, characterized in that~~ Claim 1, further comprising:

programming or configuring the electronic analysis system ~~is programmed or configured in order~~ to use the information generated by the blockage of light, in order to measure the health status of the plants.

9. (Currently amended) Device for analysis of the structure of cultivated hedgerows, for example, for equipment for mobile machines designed for continuous operation in trained and/or staked plantations, such as vineyards, ~~characterized in that it comprises~~ said device comprising:

an artificial vision system ~~(4)~~ functioning by direct transmission comprised of one or more emitters ~~(E1, E2, E3...)~~ and one or more receivers ~~(R1i, R2i, R3j...)~~, whereby this artificial vision system is arranged so that when it is mounted on a machine, one or more ~~of its~~ opto-electronic components ~~can be~~ thereof are arranged facing each other, on either side of the fruit-bearing hedgerow which spans ~~it, the device again comprising~~ the system; and

an electronic analysis system ~~(7)~~ programmed or configured to use the information produced by the blockages of the light or order to visualize and analyze the elements of the hedgerow, either during the day or at night.

10. (Currently amended) Device according to claim 9, ~~characterized in that~~ wherein the artificial vision system further comprises, ~~on the one hand,~~ an emitter module ~~(ME) made~~ comprised of at least one front emitter ~~(E1)~~ and rear emitter ~~(E2)~~, and, ~~on the other hand,~~ a receiver module ~~(MR) made~~ comprised of at least one front receiver ~~(R11, R12, R13...)~~ and a rear receiver ~~(R21, R22, R23,...)~~, in considering the direction of the movement of the machine designed for this vision system, the distance ~~(e)~~ separating the front emitter ~~(E1)~~ and the rear emitter ~~(E2)~~ being less than the width of the stakes ~~(Pi)~~ of the paling of the fruit-bearing hedgerow.

11. (Currently amended) Device according to claim 10, ~~characterized in that~~ wherein the receiver module ~~(MR)~~ comprises at least one front vertical row comprised of several spaced receivers ~~(R11, R12, R13...)~~ and at least one rear vertical row comprised of several spaced receivers ~~(R21, R22, R23...)~~, each front emitter ~~(E1)~~ and rear emitter ~~(E2)~~ being ~~designed in order~~ able to emit, in an alternating manner, ~~for example,~~ over a duration on the order of 500 ~~s [sic =ps?]~~ μs, modulated light at a frequency corresponding to the frequency that matches the front receivers ~~(R11, R12, R13...)~~ and rear receivers ~~(R21, R22, R23...)~~, respectively.

12. (Currently amended) Device according to ~~one of the claims 10 or 11, characterized in that~~ Claim 10, wherein the receiver module ~~(MR)~~ further comprises a third vertical row of receivers ~~(R31, R32, R33...)~~ for which the lower receiver ~~(R31)~~ is located at the lower part of the receiver module ~~(MR)~~, and in that the emitter module ~~(ME)~~ comprises, in the lower part, an emitter ~~(E3)~~ designed in order to emit, for example, every 500 ~~us~~ μs, light at a frequency corresponding to the frequency that matches the receivers ~~(R31, R32, R33...)~~ of the third row.

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13. (Currently amended) Device according to ~~any one of the claims 9 to 12, characterized in that~~ Claim 9, wherein the electronic analysis system is programmed or configured in order to handle the information generated by the blockages of light, in order to measure the speed of movement of the machine.

14. (Currently amended) Device according to ~~any one of the claims 9 to 13, characterized in that~~ Claim 9, wherein the electronic analysis system is programmed or configured in order to use the information generated by the blockages of light, in order to detect the stakes of the hedgerow.

15. (Currently amended) Device according to ~~any one of the claims 9 to 14, characterized in that~~ Claim 9, wherein the electronic analysis system is programmed or configured in order to use the information generated by the blockages of light, in order to detect the position of the cordon.

16. (Currently amended) Device according to ~~any one of the claims 9 to 15, characterized in that~~ Claim 9, wherein the electronic analysis system is programmed or configured in order to use the information generated by the blockage of light, in order to measure the health status of the plants.

17. (Currently amended) Device according to ~~any one of the claims 9 to 16, characterized in that~~ Claim 9, wherein the emitter modules ~~(ME)~~ and receiver modules ~~(MR)~~ of the artificial vision system ~~(4)~~ are affixed onto the chassis ~~(3-3a)~~ of the machine using mechanisms permitting a regulation of their position, mainly by height, relative to the chassis.

18. (Currently amended) Device according to ~~any one of the claims 9 to 17~~ Claim 9, applied to pre-pruning machines, ~~characterized in that~~ wherein the electronic analysis system is connected to the electro-distributor ~~(9)~~ of the control valve ~~(6)~~ that ensures the movement away from and return movement of the pruning elements ~~(5)~~ of the cutting head of these machines.

19. (Currently amended) Device according to ~~any one of the claims 9 to 18~~ Claim 9, for the implementation of the process ~~according to the invention 5~~, applicable to pre-pruning machines, ~~characterized in that~~

<u>wherein</u> the electronic analysis system ~~(7)~~ is connected to the flow-regulation valve ~~(11)~~ of the hydraulic circuit for supplying the hydraulic motors ~~(12)~~ ensuring the rotary drive of the rotary cutting tools ~~(5)~~, whose speed of rotation is indicated to the electronic analysis system ~~(7)~~ by a rotation sensor ~~(13)~~ that is influenced by the measurement of this speed, which makes it possible to create feedback by closed loop with the electronic analysis system in order to adjust the rotational speed of the rotary tools ~~(5)~~ as a function of the speed of movement of the machine ~~(2)~~.

20. (Currently amended) Device according to ~~any one of the claims 9 to 19~~ Claim 9, for implementation of the process ~~according to claim 7~~, applied to pre-pruning machines, ~~characterized in that~~

<u>wherein</u> the electronic analysis system ~~(7)~~ is connected to an electronic distributor ~~(16)~~ of the control valve ~~(17)~~ ensuring the vertical movements of the pruning assemblies ~~(14)~~ of these machines.

21. (Currently amended) Device according to ~~any one of the claims 9 to 20~~ Claim 9, for implementation of ~~the~~ <u>a</u> process ~~according to claim 8, characterized in that~~

<u>wherein</u> the electronic analysis system ~~(7)~~ is connected to a computer able to produce data ~~making it possible~~ to determine the health status of the plants.

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ABSTRACT OF THE DISCLOSURE

The ~~invention relates to a~~ method for analysing the structure of cultured hedges, equally applicable by day or by night, for a mobile, continuously-moving machine in tied or staked plantations such as vineyards, ~~characterised in that the~~ includes a system ~~uses~~ using an artificial vision system ~~(4)~~, working by transmission, which permits a detection of the shadowing of the light between one or more transmitters and one or more detectors to one side and the other of the hedge ~~and the~~. The information generated by said shadows of light are processed by an electronic analysis system ~~(7)~~, programmed or embodied to examine the elements of the structure of the hedge.